What is claimed is:

1. A semiconductor device comprising:

a semiconductor substrate;

a gate dielectric film containing at least nitrogen and a metal, the gate dielectric film being formed on the semiconductor substrate, and including a first layer region contacting the semiconductor substrate, a second layer region located at a side opposite to that of the first layer region in the gate dielectric film, and a third layer region located between the first and second layer regions, a maximum value of a nitrogen concentration in the third layer region being higher than maximum values thereof in the first and second layer regions;

a gate electrode contacting the second layer region; and

a pair of source and drain regions formed at both sides of the gate dielectric film in the semiconductor substrate.

2. The semiconductor device according to claim 1, wherein a maximum value of a metal concentration in the third layer region is higher than maximum values thereof in the first and second layer regions.

3. The semiconductor device according to claim 1, wherein the metal is one selected from the group consisting of zirconium, hafnium, titanium, tantalum, aluminum, and a rare-earth element.

4. The semiconductor device according to claim 1, wherein the gate dielectric film is formed of a metal silicate.

5. The semiconductor device according to claim 4, wherein a maximum value of a metal concentration in the third layer region is higher than maximum values thereof in the first and second layer regions.

6. The semiconductor device according to claim 5, wherein the metal is one selected from the group consisting of zirconium, hafnium, titanium, tantalum, aluminum, and a rare-earth element.

7. The semiconductor device according to claim 1, wherein a metal concentration is uniform in the first, second and third layer regions.

8. The semiconductor device according to claim 7, wherein the metal is one selected from the group consisting of zirconium, hafnium, titanium, tantalum, aluminum, and a rare-earth element.

9. The semiconductor device according to claim 7, wherein the gate dielectric film is formed of a metal oxide.

10. The semiconductor device according to claim 9, wherein an oxygen concentration in the gate dielectric film is relatively higher in the first and second layer regions than in the third layer region.

11. A method of manufacturing a semiconductor device comprising a metal silicate layer formed on a semiconductor substrate, the metal silicate layer containing at least nitrogen and including a first layer region located at a side of the semiconductor substrate, a second layer region located at a side opposite to that of the first layer region, and a third layer region located between the first and second layer regions, the method comprising:

depositing a metal silicate layer having a uniform metal concentration throughout the first, second, and third layer regions; and

performing a heat treatment on the metal silicate layer so that a nitrogen concentration in the metal silicate layer becomes higher in the third layer region than in the first and second layer regions.

12. The method of manufacturing a semiconductor device according to claim 11, wherein the nitrogen concentration distribution in the metal silicate layer is controlled by changing a ratio of argon gas, nitrogen gas, and oxygen gas over a period of time during the depositing of the metal silicate layer.

13. The method of manufacturing a semiconductor device according to claim 11, wherein the metal is one selected from the group consisting of zirconium, hafnium, titanium, tantalum, aluminum, and a rare-earth element.

14. The method of manufacturing a semiconductor device according to claim 11, wherein the metal silicate layer is a gate dielectric film of a MOSFET.

15. A method of manufacturing a semiconductor device comprising a metal

oxide layer formed on a semiconductor substrate, the metal oxide layer containing at least nitrogen and including a first layer region located at a side of the semiconductor substrate, a second layer region located at a side opposite to that of the first layer region, and a third layer region located between the first and second layer regions, the method comprising:

depositing a metal oxide layer having a uniform metal concentration throughout the first, second, and third layer regions; and

performing a heat treatment on the metal oxide layer so that a nitrogen concentration in the metal oxide layer becomes higher in the third layer region than in the first and second layer regions.

16. The method of manufacturing a semiconductor device according to claim 15, wherein the nitrogen concentration distribution in the metal oxide layer is controlled by changing a ratio of nitrogen gas over a period of time during the depositing of the metal oxide layer.

17. The method of manufacturing a semiconductor device according to claim 15, wherein the metal is one selected from the group consisting of zirconium, hafnium, titanium, tantalum, aluminum, and a rare-earth element.

18. The method of manufacturing a semiconductor device according to claim 15, wherein the metal oxide layer is a gate dielectric film of a MOSFET.